WHAT IS CLAIMED IS:

1. A laser irradiation apparatus comprising:

a first laser oscillator generating a first pulsed laser beam having a wavelength at which an absorption coefficient to the processing object is $1x10^4$ cm^{-1} or more;

means for controlling a shape and a position of a beam spot of the first laser beam;

a second laser oscillator generating a second continuous wave laser beam;

means for controlling a shape and a position of a beam spot of the second laser beam to overlap with the beam spot of the first laser beam; and

means for controlling a relative position of the beam spot of the first laser beam and the beam spot of the second laser beam to the processing object.

2. A laser irradiation apparatus according to claim 1,

wherein the first laser beam has a wavelength of second harmonic.

3. A laser irradiation apparatus according to claim 1,

wherein the second laser beam has a wavelength of fundamental wave.

4. A laser irradiation apparatus according to claim 1,

wherein the beam spot of the first laser beam is elliptical, rectangular, or linear.

5. A laser irradiation apparatus according to claim 1,

wherein the beam spot of the second laser beam is elliptical, rectangular, or linear.

6. A laser irradiation apparatus according to claim 1,

wherein the first laser oscillator is selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

7. A laser irradiation apparatus according to claim 1,

wherein the second laser oscillator is selected from the group consisting of an

Ar laser, a Kr laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, an alexandrite laser, a Ti: sapphire laser, and a helium-cadmium laser.

8. A laser irradiation apparatus according to claim 1,
wherein:
the processing object comprises a substrate having a thickness of "d" which is transparent to the first laser beam; and
an incident angle "$\phi 1$" of the first laser beam to a surface of the processing object satisfies an inequality of $\phi 1 \geqq \arctan (W1/2d)$ when W1 is defined as a length of a major axis or a minor axis of the beam spot of the first laser beam.

9. A laser irradiation apparatus according to claim 1,
wherein:
the processing object comprises a substrate having a thickness of "d" which is transparent to the second laser beam; and
an incident angle "$\phi 2$" of the second laser beam to a surface of the processing object satisfies an inequality of $\phi 2 \geqq \arctan (W2/2d)$ when W2 is defined as a length of a major axis or a minor axis of the beam spot of the second laser beam.

10. A laser irradiation apparatus comprising:
a first laser oscillator generating a first pulsed laser beam having a wavelength of visible light or a shorter wavelength than that of visible light;
means for controlling a shape and a position of a beam spot of the first laser beam;
a second laser oscillator generating a second continuous wave laser beam;
means for controlling a shape and a position of a beam spot of the second laser beam to overlap with the beam spot of the first laser beam; and
means for controlling a relative position of the beam spot of the first laser beam and the beam spot of the second laser beam to a processing object.

11. A laser irradiation apparatus according to claim 2,
wherein the first laser beam has a wavelength of second harmonic.

12. A laser irradiation apparatus according to claim 2,
wherein the second laser beam has a wavelength of fundamental wave.

13. A laser irradiation apparatus according to claim 2,

wherein the beam spot of the first laser beam is elliptical, rectangular, or linear.

14. A laser irradiation apparatus according to claim 2,

wherein the beam spot of the second laser beam is elliptical, rectangular, or linear.

15. A laser irradiation apparatus according to claim 2,

wherein the first laser oscillator is selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

16. A laser irradiation apparatus according to claim 2,

wherein the second laser oscillator is selected from the group consisting of an Ar laser, a Kr laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, an alexandrite laser, a Ti: sapphire laser, and a helium-cadmium laser.

17. A laser irradiation apparatus according to claim 2,

wherein:

the processing object comprises a substrate having a thickness of "d" which is transparent to the first laser beam; and

an incident angle "$\phi 1$" of the first laser beam to a surface of the processing object satisfies an inequality of $\phi 1 \geqq \arctan(W1/2d)$ when W1 is defined as a length of a major axis or a minor axis of the beam spot of the first laser beam.

18. A laser irradiation apparatus according to claim 2,

wherein:

the processing object comprises a substrate having a thickness of "d" which is transparent to the second laser beam; and

an incident angle "$\phi 2$" of the second laser beam to a surface of the processing object satisfies an inequality of $\phi 2 \geqq \arctan(W2/2d)$ when W2 is defined as a length of a major axis or a minor axis of the beam spot of the second laser beam.

19. A laser irradiation method comprising the step of;

irradiating a processing object with a first pulsed laser beam having a wavelength at which an absorption coefficient to the processing object is $1x10^4$ cm^{-1} or more and a second continuous wave laser beam,

wherein when the first laser beam and the second laser beam are irradiated, a beam spot formed on a surface of the processing object by the first laser beam and a beam spot formed on the surface of the processing object by the second laser beam are overlapped.

20. A laser irradiation method according to claim 19,

wherein the first laser beam has a wavelength of second harmonic.

21. A laser irradiation method according to claim 19,

wherein the second laser beam has a wavelength of fundamental wave.

22. A laser irradiation method according to claim 19,

wherein the beam spot formed on the surface of the processing object by the first laser beam is elliptical, rectangular, or linear.

23. A laser irradiation method according to claim 19,

wherein the beam spot formed on the surface of the processing object by the second laser beam is elliptical, rectangular, or linear.

24. A laser irradiation method according to claim 19,

wherein the first laser beam is emitted from a laser oscillator selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

25. A laser irradiation method according to claim 19,

wherein the second laser beam is emitted from laser oscillator selected from the group consisting of an Ar laser, a Kr laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, an alexandrite laser, a Ti: sapphire laser, and a helium-cadmium laser.

26. A laser irradiation method according to claim 19,

wherein:

the processing object comprises a substrate having a thickness of "d" which is transparent to the first laser beam; and

an incident angle "$\phi 1$" of the first laser beam to the surface of the processing object satisfies an inequality of $\phi 1 \geqq \arctan (W1/2d)$ when W1 is defined as a length of a major axis or a minor axis of the beam spot formed on the surface of the processing object by the first laser beam.

27. A laser irradiation method according to claim 19,

wherein:

the processing object comprises a substrate having a thickness of "d" which is transparent to the second laser beam; and

an incident angle "$\phi 2$" of the second laser beam to the surface of the processing object satisfies an inequality of $\phi 2 \geqq \arctan (W2/2d)$ when W2 is defined as a length of a major axis or a minor axis of the beam spot formed on the surface of the processing object by the second laser beam.

28. A laser irradiation method comprising the step of;

irradiating a processing object with a first pulsed laser beam having a wavelength of visible light or a shorter wavelength than that of visible light and a second continuous wave laser beam,

wherein when the first laser beam and the second laser beam are irradiated, a beam spot formed on a surface of the processing object by the first laser beam and a beam spot formed on the surface of the processing object by the second laser beam are overlapped.

29. A laser irradiation method according to claim 28,

wherein the first laser beam has a wavelength of second harmonic.

30. A laser irradiation method according to claim 28,

wherein the second laser beam has a wavelength of fundamental wave.

31. A laser irradiation method according to claim 28,

wherein the beam spot formed on the surface of the processing object by the first laser beam is elliptical, rectangular, or linear.

32. A laser irradiation method according to claim 28,

wherein the beam spot formed on the surface of the processing object by the second laser beam is elliptical, rectangular, or linear.

33. A laser irradiation method according to claim 28,

wherein the first laser beam is emitted from a laser oscillator selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

34. A laser irradiation method according to claim 28,

wherein the second laser beam is emitted from laser oscillator selected from the group consisting of an Ar laser, a Kr laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, an alexandrite laser, a Ti: sapphire laser, and a helium-cadmium laser.

35. A laser irradiation method according to claim 28,

wherein:

the processing object comprises a substrate having a thickness of "d" which is transparent to the first laser beam; and

an incident angle "$\phi 1$" of the first laser beam to the surface of the processing object satisfies an inequality of $\phi 1 \geqq \arctan(W1/2d)$ when W1 is defined as a length of a major axis or a minor axis of the beam spot formed on the surface of the processing object by the first laser beam.

36. A laser irradiation method according to claim 28,

wherein:

the processing object comprises a substrate having a thickness of "d" which is transparent to the second laser beam; and

an incident angle "$\phi 2$" of the second laser beam to the surface of the processing object satisfies an inequality of $\phi 2 \geqq \arctan(W2/2d)$ when W2 is defined as a length of a major axis or a minor axis of the beam spot formed on the surface of

the processing object by the second laser beam.

37. A method for manufacturing a semiconductor device comprising the steps of;

forming a semiconductor film on a insulating surface; and

irradiating the semiconductor film with a first pulsed laser beam having a wavelength at which an absorption coefficient to the semiconductor film is $1x10^4$ cm^{-1} or more and a second continuous wave laser beam to crystallize the semiconductor film,

wherein when the first laser beam and the second laser beam are irradiated, a beam spot formed on a surface of the semiconductor film by the first laser beam and a beam spot formed on the surface of the semiconductor film by the second laser beam are overlapped.

38. A method for manufacturing a semiconductor device according to claim 37,

wherein the first laser beam has a wavelength of second harmonic.

39. A method for manufacturing a semiconductor device according to claim 37,

wherein the first laser beam has a wavelength of the fundamental wave.

40. A method for manufacturing a semiconductor device according to claim 37,

wherein the beam spot formed on the surface of the semiconductor film by the first laser beam is elliptical, rectangular, or linear.

41. A method for manufacturing a semiconductor device according to claim 37,

wherein the beam spot formed on the surface of the semiconductor film by the second laser beam is elliptical, rectangular or linear.

42. A laser irradiation method according to claim 37,

wherein the first laser beam is emitted from a laser oscillator selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a

Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

43. A laser irradiation method according to claim 37,

wherein the second laser beam is emitted from laser oscillator selected from the group consisting of an Ar laser, a Kr laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, an alexandrite laser, a Ti: sapphire laser, and a helium-cadmium laser

44. A method for manufacturing a semiconductor device according to claim 37,

wherein:

the semiconductor is formed over a substrate comprising the insulating surface and having a thickness of "d" which is transparent to the first laser beam; and

an incident angle "$\phi 1$" of the first laser beam to the surface of the semiconductor film satisfies an inequality of $\phi 1 \geqq \arctan(W1/2d)$ when W1 is defined as a length of a major axis or a minor axis of the beam spot formed on the surface of the semiconductor film by the first laser beam.

45. A method for manufacturing a semiconductor device according to claim 37,

wherein:

the semiconductor is formed over a substrate comprising the insulating surface and having a thickness of "d" which is transparent to the second laser beam; and

an incident angle "$\phi 2$" of the second laser beam to the surface of the semiconductor film satisfies an inequality of $\phi 2 \geqq \arctan(W2/2d)$ when W2 is defined as a length of a major axis or a minor axis of the beam spot formed on the surface of the semiconductor film by the second laser beam.

46. A method for manufacturing a semiconductor device comprising the steps of;

forming a semiconductor film on a insulating surface; and

irradiating the semiconductor film with a first pulsed laser beam having a wavelength of visible light or a shorter wavelength than that of visible light and a second continuous wave laser beam to crystallize the semiconductor film,

wherein when the first laser beam and the second laser beam are irradiated, a beam spot formed on a surface of the semiconductor film by the first laser beam and a beam spot formed on the surface of the semiconductor film by the second laser beam are overlapped.

47. A method for manufacturing a semiconductor device according to claim 46,

wherein the first laser beam has a wavelength of second harmonic.

48. A method for manufacturing a semiconductor device according to claim 46,

wherein the first laser beam has a wavelength of the fundamental wave.

49. A method for manufacturing a semiconductor device according to claim 46,

wherein the beam spot formed on the surface of the semiconductor film by the first laser beam is elliptical, rectangular, or linear.

50. A method for manufacturing a semiconductor device according to claim 46,

wherein the beam spot formed on the surface of the semiconductor film by the second laser beam is elliptical, rectangular or linear.

51. A laser irradiation method according to claim 46,

wherein the first laser beam is emitted from a laser oscillator selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

52. A laser irradiation method according to claim 46,

wherein the second laser beam is emitted from laser oscillator selected from the group consisting of an Ar laser, a Kr laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, an alexandrite laser, a Ti: sapphire laser, and a helium-cadmium laser

53. A method for manufacturing a semiconductor device according to claim 46,

wherein:

the semiconductor is formed over a substrate comprising the insulating surface and having a thickness of "d" which is transparent to the first laser beam; and

an incident angle "$\phi 1$" of the first laser beam to the surface of the semiconductor film satisfies an inequality of $\phi 1 \geqq \arctan(W1/2d)$ when W1 is defined as a length of a major axis or a minor axis of the beam spot formed on the surface of the semiconductor film by the first laser beam.

54. A method for manufacturing a semiconductor device according to claim 46,

wherein:

the semiconductor is formed over a substrate comprising the insulating surface and having a thickness of "d" which is transparent to the second laser beam; and

an incident angle "$\phi 2$" of the second laser beam to the surface of the semiconductor film satisfies an inequality of $\phi 2 \geqq \arctan(W2/2d)$ when W2 is defined as a length of a major axis or a minor axis of the beam spot formed on the surface of the semiconductor film by the second laser beam.